Volunteer Lake Assessment Program Individual Lake Reports

KNOWLES POND, NORTHFIELD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	365	**Max. Depth (m):**	17	**Flushing Rate (yr^{-1})**	0.6
Surface Area (Ac.):	60	**Mean Depth (m):**	5.8	**P Retention Coef:**	0.73
Shore Length (m):	2,600	**Volume (m^3):**	1,396,500	**Elevation (ft):**	746

TROPHIC CLASSIFICATION

Year	Trophic class
2000	OLIGOTROPHIC

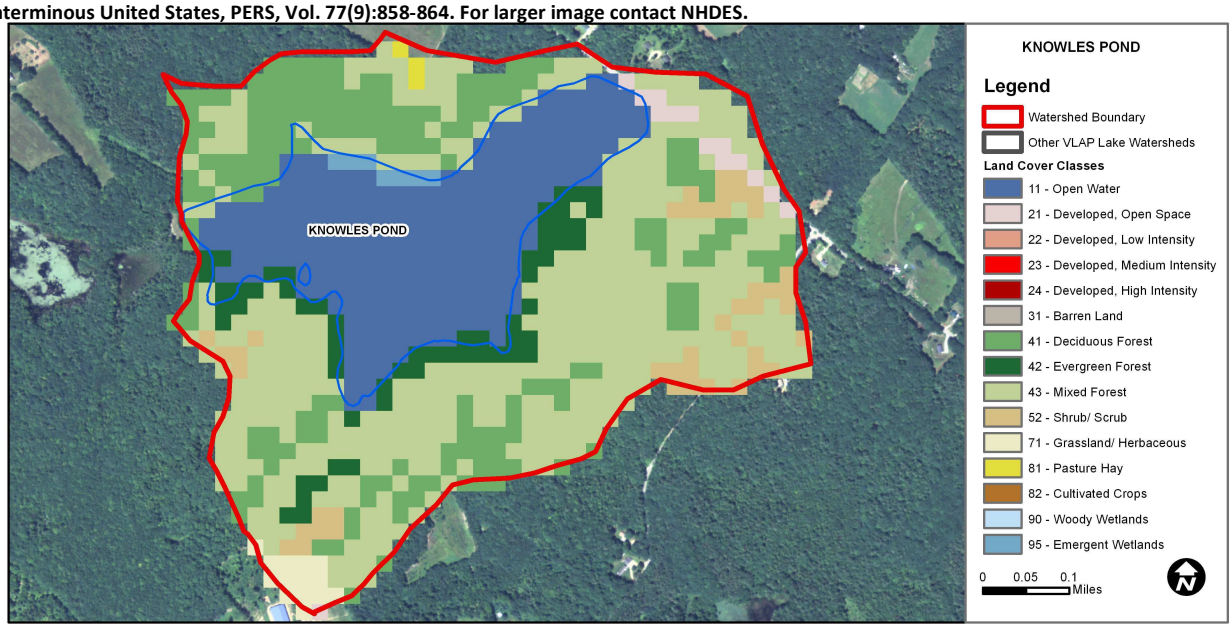
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	24.4	Barren Land	0	Grassland/Herbaceous	1.47
Developed-Open Space	1.47	Deciduous Forest	19.47	Pasture Hay	0.32
Developed-Low Intensity	0	Evergreen Forest	6.21	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	41.46	Woody Wetlands	0
Developed-High Intensity	0	Shrub-Scrub	4.63	Emergent Wetlands	0.74

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
KNOWLES POND, NORTHFIELD, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll was very low and well below the NH lake median.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride were low and approximately equal to or below the NH lake median values.
- **E. COLI:** E. coli was very low and much less than state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) and metalimnetic (middle water layer) phosphorus levels were very low and well below the NH lake median. Hypolimnetic (lower water layer) phosphorus was slightly greater and the turbidity of the sample was elevated indicating potential bottom sediment contamination. Tributary phosphorus levels were low.
- **TRANSPARENCY:** Transparency was good and much greater than the NH lake median.
- **TURBIDITY:** Hypolimnetic turbidity was elevated possibly due to bottom sediment contamination or an increase in organic substances due to low oxygen conditions.
- **PH:** pH levels were lower than desirable and much lower in the hypolimnion due to the release of acidic by-products from decomposing organic matter.
- **RECOMMENDED ACTIONS:** Increase monitoring frequency to three times per summer (June, July, August) to better assess summer water quality averages and historical trends.

Dissolved Oxygen & Temperature Profile

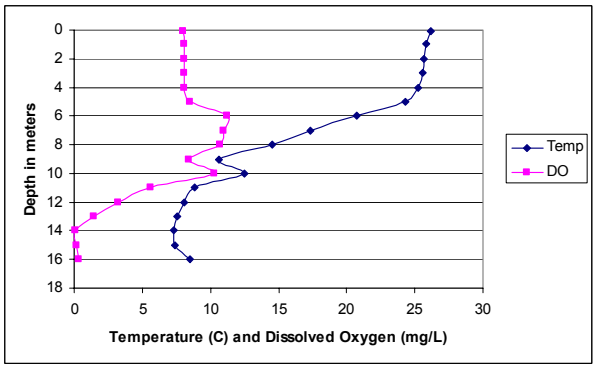


Table 1. 2012 Average Water Quality Data for KNOWLES POND

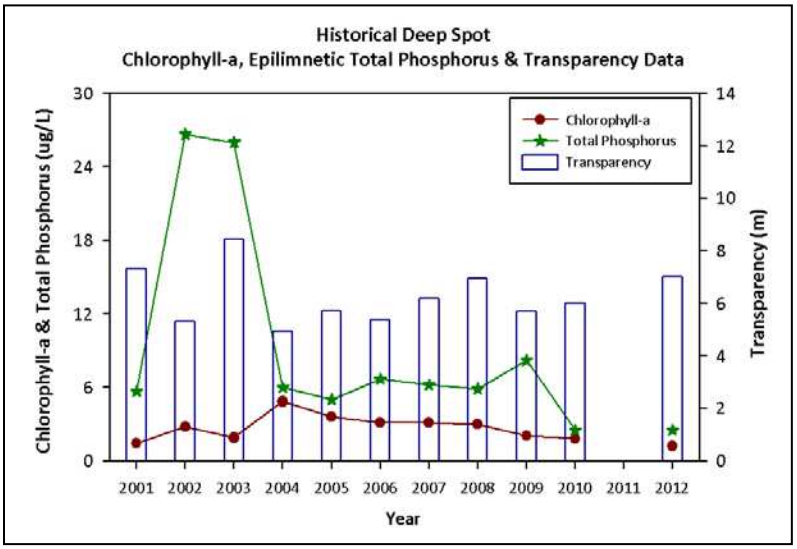
Station Name	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Beach					2					
Deep Epilimnion	2.2	1.19	4	30.4		3	7.00	6.70	0.60	6.44
Metalimnion				30.4		3			0.51	6.49
Deep Hypolimnion				35.0		14			1.71	5.72
Inlet				30.3		3			0.50	6.50
Outlet				30.4		8			0.53	6.52

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	N/A	Ten consecutive years of data collection necessary for trend analysis.
Transparency	N/A	Ten consecutive years of data collection necessary for trend analysis.
Phosphorus (epilimnion)	N/A	Ten consecutive years of data collection necessary for trend analysis.



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